USDA United States Department of Agriculture
Natural Resources Conservation Service

Cover Crop *(Code 340)*

Conservation Practice Job Sheet

Description - This practice establishes close-growing grasses, legumes or small grain crops to provide seasonal protection. Cover crops help improve soil and water quality by reducing soil erosion, increasing organic matter and capturing and recycling nutrients in the soil profile. Cover crops can also be used to fix atmospheric nitrogen, reduce soil compaction, manage soil moisture and provide supplemental forage for livestock.

Purposes

- ☐ Reduce erosion from wind and water.
- ☐ Maintain or increase soil health and organic matter content.
- ☐ Reduce water quality degradation by utilizing excessive soil nutrients.
- ☐ Suppress excessive weed pressures and break pest cycles.
- ☐ Improve soil moisture use efficiency.
- ☐ Minimize soil compaction.

Requirements:

1. Plant species, seeding rates, seeding dates, seeding depths, and planting methods will be consistent with the Appendix-A (cover crop). It can also be found in Ohio eFOTG, Section IV, D. Appendices or the table on the next page.
2. The cover crop species selected will be compatible with other components of the cropping system and address all applicable purposes as indicated above. For the purpose of "reduce water quality degradation by utilizing excessive soil nutrients" select cover crop species that will result in some plant growth (at least ½ of the proportional seeding rate) for the entire fallow period.
3. Cover crops will be terminated by frost, mowing, tillage, crimping, and/or herbicides singularly or in combination in preparation for the subsequent crop and if applicable compliant with NRCS Cover Crop Termination Guidelines (attached). Do not harvest cover crops for seed.
4. Herbicides used with cover crops must be compatible with the subsequent crop and before species selection consider past herbicide use; herbicide carryover may cause injury to the cover crop. Consult your crop consultant or herbicide retailer if any questions arise about herbicide carryover and possible effect on specific cover crop species. Be sure to follow herbicide labels.
5. Do not use any seeding material that contains any listed weeds on the state's noxious weed or invasive species lists.
6. Cover crop residue will not be burned.

Seed Quality

The quality of seed used in conservation practices can have a dramatic effect on the success of the practice. The seeding rate for cover crops used by NRCS in this document assumes a level of seed quality. As a result, there may be an adjustment that needs to be added to the minimum seeding rate to account for the site-specific seed quality being used if the seed quality does not meet the criteria assumed in the calculation.

Additionally, NRCS is committed to preventing the spread of noxious, invasive and herbicide resistant weed species. Therefore, all seed used in conservation practices must have a seed tag or be tested for seed quality and percent of weed seed prior to use. The use of "bin run" seed is allowed in NRCS conservation practices if the seed has been tested, the seeding rate has been adjusted for seed quality if needed and the seed meets the minimum quality as specified in all applicable laws. The seed test must include percent purity, percent germination, percent weed seed and a listing of any Ohio noxious or invasive weeds contained within the sample. If the seed test lists any noxious or invasive weeds, the seed must be cleaned to remove the weeds and retested before use until the test comes back with no noxious or invasive weeds listed.

Seed Testing

Producers wishing to use uncertified seed sources (bin run, client harvest or bulk seed sources) for NRCS practices **must** include, seed tested by a reputable lab before use reports the following:

1. Percent Purity
2. Percent Germination
3. Percent Weed Seed
4. Listing of noxious or invasive weeds contained within the sample/1

For additional information on seed testing contact:

Ohio Department of Agriculture
Division of Plant Health
Grain, Feed & Seed Section
8995 Main Street, Reynoldsburg, Ohio

/1. If the seed test lists any noxious or invasive weeds the seed must be cleaned to remove the weeds and retested before use until the test comes back with no noxious or invasive weeds listed.

Additional Seed Quality Adjustment Factor[1]

Purity \ Germination	98%	96%	94%	92%	90%	88%	86%	84%	82%	80%
98%	-	-	-	-	-	-	1.02	1.04	1.07	1.11
96%	-	-	-	-	-	1.01	1.04	1.07	1.10	1.13
94%	-	-	-	-	1.01	1.04	1.07	1.09	1.13	1.16
92%	-	-	-	1.01	1.04	1.07	1.09	1.12	1.16	1.19
90%	-	-	1.01	1.04	1.06	1.09	1.12	1.15	1.19	1.22
88%	-	1.01	1.04	1.07	1.09	1.12	1.15	1.18	1.22	1.25
86%	1.02	1.04	1.07	1.09	1.12	1.15	1.18	1.21	1.25	1.28
84%	1.04	1.07	1.10	1.12	1.15	1.18	1.21	1.25	1.28	1.32
82%	1.07	1.10	1.13	1.16	1.19	1.22	1.25	1.28	1.32	1.35
80%	1.11	1.13	1.16	1.19	1.22	1.25	1.28	1.32	1.35	1.39

1. The "additional seed quality adjustment factor" is to be used only if the percent germination and percent purity is lower than the assumed value. Combinations without numbers (-) do not need an adjustment of the listed seeding rate.

All seeding rates in Appendix-A (cover crop) Figure 1, and this job sheet are reported as an actual seeding rate. This seeding rate assumes high-quality seed with higher levels of germination and purity. The Seed Quality Adjustment Factor table should be used if the seed quality is lower than the assumed value. The equation below is to be used to adjust the seeding rate to account for the site-specific seed quality. If an adjustment factor is not listed in the table for the germination and purity, then the specific quality of the seed is equal to or greater than the assumed level and no adjustment is needed.

Pure Live Seed (PLS) x Adjustment Factor = Seeding rate

For additional information on seeding rate calculations see Ohio Appendix-A (cover crop) located on the eFOTG under Section IV, D. Appendices.

Cover Crop Seeding Methods

The method of cover crop establishment can also have a dramatic effect on the success of the practice. When selecting the cover crop seeding method one should consider the advantages and disadvantages of each available method before implementation. Drilling, narrow row planting, harrow seeding and broadcast seeding before light tillage (rotary harrows, vertical tillage) will result in greater soil/seed contact and improved depth control as compared to broadcast seeding and aerial applications. For this document all seeding rates are assumed to be seeded with some seed depth control; if a method is used that does not have seed depth control such as broadcast or aerial seeding, a 20 percent increase in the seeding rate should be included to account for increased risk of poor emergence.

Figure 1. Cover crop seeding dates, seeding rates and seeding depths for common cover crop species used in Ohio for complete list see Appendix A (cover crop) located on the eFOTG under Section IV, D.

		Seeding Rate (lb/ac)[1]							Planting Date Range[2]	
Plant Species	Life cycle[3]	Pure Stand	¾	½	⅓	¼	Forage Stand	Seeding depth (in)	Northern	Southern
Cool-Season Growth										
Non-Legumes										
Winter Rye (Secale cereale)	nwk	50	38	25	17	13	88	¾ to 1 ½	7-15 to 11-1	8-1 to 11-15
Winter Wheat[5] (Triticum aestivum)	nwk	64	48	32	21	16	94	¾ to 1 ½	9-22 to 10-22	9-30 to 11-1
Winter Triticale (× Triticosecale)	nwk	60	45	30	20	15	94	¾ to 1 ½	7-15 to 10-22	8-1 to 11-1
Annual Ryegrass (Lolium multiflorum)	nwk[4]	18	13	9	6	4	28	¼ to ½	8-1 to 9-20 or 3-15 to 5-1	8-1 to 9-20 or 3-1 to 4-20
Oats (Avena sativa)	wk	40	30	20	14	10	88	½ to 1 ½	8-1 to 9-20 or 3-15 to 4-30	8-1 to 9-30 or 3-1 to 4-15
Oilseed Radish (Raphanus sativus)	wk	-	-	-	1	0.7	12	¼ to ¾	7-15 to 9-15 or 3-15 to 5-1	7-15 to 9-30 or 3-1 to 4-20
Rapeseed/Canola/Kale (Brassica napus)	nwk[6]	4	3	2	1.5	1	8	¼ to ½	7-15 to 9-15 or 3-15 to 5-1	7-15 to 9-30 or 3-1 to 4-20
Legumes										
Red Clover *(Trifolium pretense)*	nwk	9	7	5	3	2	-	¼ to ½	7-20 to 8-30 or 2-1 to 5-1	8-1 to 9-15 or 2-1 to 4-15
Crimson Clover *(Trifolium incarnatum)*	nwk	12	9	6	4	3	-	¼ to ½	6-1 to 9-15	6-1 to 9-30
Hairy Vetch *(Vicia villosa)*	nwk	15	11	8	5	4	-	½ to 1 ½	7-20 to 9-20 or 3-10 to 5-1	8-1 to 10-1 or 3-1 to 4-20

1. Seeding rates are listed as "pure stand" with the assumption to be seeded with some seed depth control; if a method is used that does not have seed depth control such as broadcast or aerial seeding, a 20% increase in the seeding rate should be included to account for increased risk of poor emergence. The ¾, ½, ⅓ and ¼ seeding rates are to be used in creating mixes. The forage stand rate is to be used if the cover crop is to also serve as a livestock forage. If a rate is not listed (-) the seeding selected is generally not recommended.
2. Northern Ohio is generally north of I-70 and southern Ohio is generally south of I-70.
   To implement a cover crop, the selected species must be planted within the listed planting date window or up to 2 weeks after the last planting date listed if the seeding rate is increased by 20 percent.
3. wk = winter killed cover crops; nwk = non-winter killed cover crops
4. Non-winter killed only when planted during the fall dates.
5. Do not plant until after the Hessian fly free date.
6. Fall planted varieties planted in the fall are "non-winter killed," and spring planted varieties planted in the fall or spring are winter killed.

Producer:	**Tract:**
Fields	**After the Following Crops**

Purpose/Addressed resource concerns (check all that apply)**:**

☐ **Reduce erosion** ☐ **Maintain or increase soil health** ☐ **Reduce water quality degradation**

☐ **Weed/pest suppression** ☐ **Soil Moisture efficiency** ☐ **Minimize soil compaction Other**_____

☐ **Herbicide carryover issues have been discussed for this project.**

Fields	**Species**	**Method of Seeding** D = Drill/planted B = Broadcast/ Aerial	**Seeding Date Range/1**	**Seeding Rate/2** (adjusted for seed quality and seeding method if needed)	**Date or Stage and Method of Cover Crop Termination/3**

/1 Where mixes are used that have differing seeding deadlines, use the earliest planting date. To implement cover crop the selected species must be planted within the listed planting date window or up to 2 weeks after the last planting date listed if the seeding rate is increased by 20%.

/2 Adjust seeding rate from the listed seeding rate in Fig. 1 based on seed quality and seeding method. If selected seeding method is "Broadcast or Aerial" with little seed depth placement multiply the seeding rate by 1.2, all other seeding methods do not need a seeding method adjustment.

/3 See attached cover crop termination guidelines for crop insurance requirements

For Questions Regarding the Application and Management of Cover Crops Contact:

_____ @ Phone _____

OPERATION AND MAINTENANCE

Evaluate the cover crop to determine if the cover crop is meeting the planned purpose(s). If the cover crop is not meeting the purpose(s):

- Adjust the management.
- Change the species of cover crop.
- Choose a different technology.

Certification Statement:
I certify that implementation of this conservation practice is complete, meets criteria for the stated purpose(s), and meets the NRCS conservation practice standard and specifications.

X_____
Planner/Technical Service Provider